VIBRATION-ROTATION-TUNNELING SPECTRUM OF FORMIC ACID DIMER IN THE 7.3μm REGION

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The vibration-rotation-tunneling spectrum of formic acid dimer, $(HCOOH)_2$, in the spectral region 1369-1375 cm^{-1}has been measured by a multi-step rapid-can method in a slit jet expansion using a distributed-feedback quantum cascade laser. The observed spectrum is assigned to the O-C-H bending fundamental band. The tunneling splitting in the vibrational excited state is determined to be about 0.005 cm^{-1}, which is much smaller than that in the ground state, 0.0165 cm^{-1}(Goroya et al.,J. Chem. Phys. 140, 164311 (2014)). Strong local perturbations involving transitions with J ¿ 9, K = 0 and 1 are identified in the observed spectrum. The deperturbation analysis will be presented.